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Analysis of the physical changes of rural settlements and its impact on the sense of belonging to the local residents (Case study: Mountain rural district in the south of Guilan Province, Northwest Iran)

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ABSTRACT

The current research seeks to find an answer to the question of why the sense of belonging to a place has faded in rural settlements. The research method combines descriptive-analytical methods, field observations, and a questionnaire that also uses remote sensing techniques. For this purpose, 374 questionnaires in the studied area were distributed among the residents of the mountain villages of Rudbar, Siahkal, and Amlesh. Additionally, to support the number of physical changes that occurred during the studied period, we utilized the Support Vector Machine (SVM) algorithm and several surveys to record sample and educational cases using GPS. Then, the land use map in 5 classes was extracted from Landsat satellite images in 2000 and 2022. The results indicate visible changes, especially for the use of man-made structures, which is the result of the change of physical and architectural elements and, as a result, the reduction of place belonging among the residents of the studied villages. This is despite the sense of physical belonging to the place of traditional settlements is more compared to new settlements. Finally, the lack of necessary infrastructure in mountainous villages and livelihood problems have caused events such as the sale of land, the migration of villagers, and the loss of the sense of belonging to a place

Keywords: Sense of place belonging, Physical and architectural elements, Rural settlements, Remote sensing, SVM.
Article type: Research Article.

INTRODUCTION

Research on the concept of sense of place (SOP) has become increasingly important in recent years (Dominik *et al.* 2024). Place belonging is a cognitive relationship with a specific environment or space that has been widely researched in social and behavioural sciences in the last two decades. However, it is challenging for researchers to interpret the mixed messages presented in the literature on place and the understanding of multiple place terms (Altman 1992; Raymond *et al.* 2010). The emotional perception of the residents of traditional villages originates from the understanding of the relationship between man and the earth in these areas and leads to the attitude and behavior of the residents. Against the background of previous studies that have focused on technical rationality but neglected to explore "human" emotional factors, research on the emotional perception of traditional village residents is crucial for promoting high-quality people-centred rural development (Ma *et al.* 2024). From Relph's point of view, places are concepts that are experienced directly from the world and are not abstract unlike the concept of space (Relph 1976). Meanwhile, the art of architecture creates a creative place by collecting the features of the environment (Safian 2012). During the last few decades, with the acceleration of population growth and the need to provide shelter, the proper design of settlements has been neglected, and because of that, problems such as a decrease in the sense of belonging and peace have arisen for the residents (Shams 2010). This term has two social and spatial conceptual dimensions (Gilmartin 2017). The sense of belonging causes the space to become a

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place based on behavioral and sensory characteristics, and this event is manifested for each person in the form of a feeling of comfort in an environment and intersects with the concept of identity for people (Falahat 2014). Tuan (1974) applies the term "friendship place" to the sense of belonging, and Saramona (2006) believes that this concept is explained in architecture through the design of the physical territory, and creating a distinction between areas and surrounding spaces or physical separation (Saramona 2006). Heidegger, the phenomenological philosopher, also considers the architect's role in creating a place as an opportunity for the building to face and interact with the colorful human being (Safian 2010). Feelings, as the center of a person's life, can encourage people to deeply understand the changes in the material environment and the surrounding social environment (Reddy 2001). A phenomenon that psychology defines as a person's attitude towards whether the objective reality meets the needs of the person or not. Perception refers to the formation of mental evaluations that are processed by the brain's nervous system when something stimulates the body's sensory tissue organs (Jia 2004). Ramkissoon (2023) found in a research that the stronger the dependence of residents on a place, more behaviors they perform that benefit the environment. From the beginning of the 21st century, geographers gradually paid attention to the impact of emotions on space and society. The concept of emotional geography was proposed by Anderson and Smith and entered the literature of geographical studies, which emphasized the influence of emotions on spatial, human and earth relations (Zhu & Gao 2015). The emotional perception of the residents of traditional villages is based on the emotional relationship between people and place (Luo *et al.* 2022). Tuan's observation of Topophilia led to her statement that, in addition to providing the necessities of life, places bring a sense of identity and security to people (Tuan 1974). In the following, concepts such as attachment to place, sense of belonging and other words related to the relationship between humans and the earth were produced (Huang *et al.* 2006). Gustafson (2001) presented the conceptual mode of place and its constituent factors, listed and analyzed the places that were considered important in the opinion of the respondents. The results showed that concepts were drawn around the three main factors of self, others and the environment (Fig. 1).

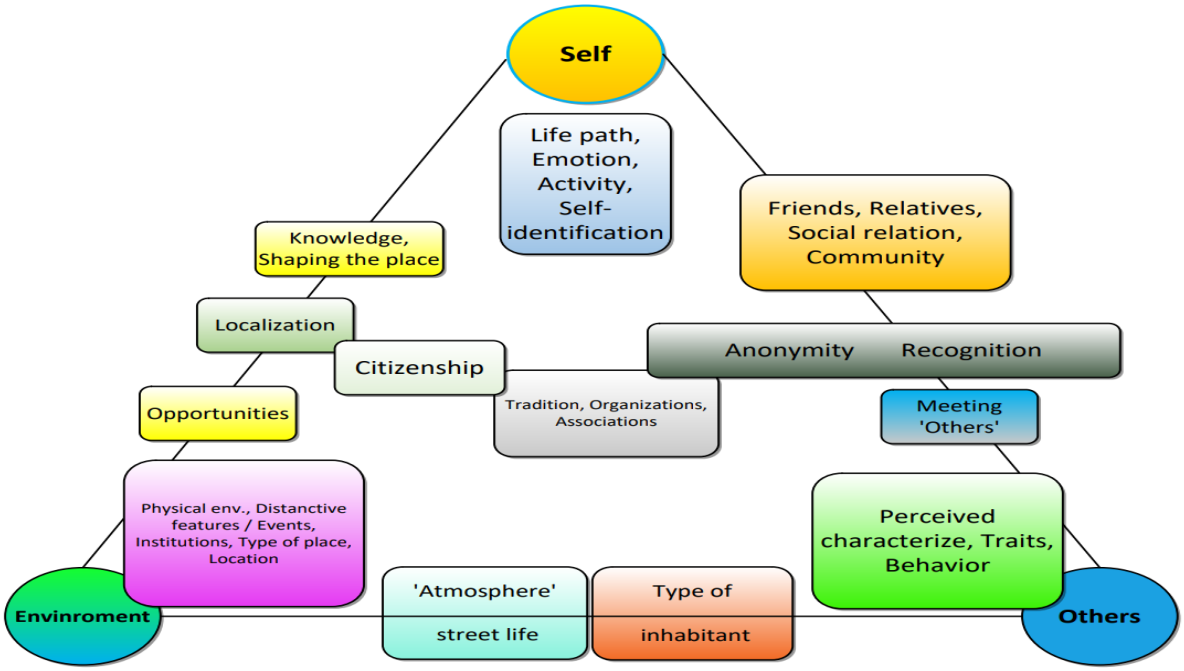


Fig. 1. Conceptual model of place and its constituent factors (Gustafson, 2001).

The present study tries to explain the relationship between the sense of place belonging and the physical changes of the settlement by examining the sense of place belonging in the southern mountain villages of Guilan Province, Iran including areas of Rudbar, Siahkal and Amlesh counties, and to answer the questions about the factors effective in creating a sense of place belonging in these settlements.

Theoretical foundations

Phenomenological approach to the sense of spatial belonging

A place is a part of the space that has a special identity based on a set of its features. Place has content and, unlike space, which tends to be infinite, it can be separated by a border (Afshar Naderi 2018; Sarmast 2019). Based on

the emotional reactions towards each other, humans and the environment form a link that forms the identity of both of them. It is called the sense of belonging to a place to the extent that people identify themselves with the place they belong to. The feeling of belonging by changing the concept of space to place, along with achieving identity, causes a sense of comfort for the people of that place (Falahat 2004). Place has the ability to organize and concentrate human experiences and behaviors in the concept of space, and in the dialectic of justice and place. It is believed that a person's experiences are made from the environment (Simon 2008). The sense of belonging to a place includes interwoven layers of emotions and human attachment to the environment in which he lives. Schultz states that in places that have a specific personality, the concept of belonging to the place is formed. Characteristics such as texture, color and materials used in the construction of buildings are the most obvious examples of these characteristics (Norberg-Schultz 1997). This feeling creates an unbreakable bond between the residents and the place, which manifests positively and deepens over time along with the expansion of the relationship between the person and the environment (Relf 1976). The proper coordination of architecture and human space lead to the feeling of pleasure, security and emotional perception of people and strengthens the concept of identity of people. Phenomenologists describe this quality using phrases such as Place friendship, place personality and place experience are called. They emphasize the immaterial meanings of this concept (Relph 1976). Also, this sense is interpreted as place-friendliness (Tuan 1974). The physical realm is understood in design and architecture different from physical areas and spaces (Sarmona 2006). Schultz believes that the three factors of spatial order, topography and morphology form the foundations of the sense of place (Norberg- Schultz 2004).

The empiricist approach to the sense of belonging

In the studies conducted in environmental psychology, Maslow's model or the pyramid of basic human needs is considered by the empiricist approach (Danshpour 2008). He emphasizes human motivations and needs from the beginning of birth and states are always with humans and it is believed that humans seek to satisfy these needs at different levels by interacting with the environment and changing its capabilities. Also, Maslow categorizes human needs into two groups: basic or primary needs and superior or higher needs. It also includes the sense of belonging in the category of basic needs, which has been considered by many designers, while most empiricists have usually investigated the social factors that contribute to the formation of this feeling. According to Kanter, place cannot be independent from humans. Kanter explained three components of body, activity and imagination for each place (Kanter 1977).

Research background

Dominik *et al.* (2024) consider place conceptualization as a branch of place attachment content. The results of their research indicate that conceptualization is essential in the process of place formation and education play a pivotal role. Also, the correct understanding of the sense of place has an effect on individual personality (Dominik *et al.* 2024). Konduri and Lee investigating rural Amidong, South Korea, found that attachment to place, sense of community, and community participation in re-creation can contribute to the re-creation of meaningful places. Lessons from Amy Dong offers insights into ways to strengthen people-to-people relationships through design and planning processes in a declining context with an aging population (Konduri & Lee 2023). Belanche et al. compared the residents of rural settlements and urban communities in Spain to study the different developments of place identity in rural and urban communities (Belanche *et al.* 2021). Puren *et al.* studied the interaction between people and a specific rural location in a village in South Africa that has been registered as a World Heritage Site. The results of their research explained a method to achieve the use of people's experiences in relation to the rural landscape to inform spatial planning guidelines (Puren *et al.* 2018). By a research, Eren raised the question whether attachment to place can provide cultural sustainability (Eren, 2013). Raymond et al. conducted a study on measuring attachment to place, personal, social and environmental connections (Raymond *et al.* 2010). Wu *et al.* measured residents' human-earth feelings through four dimensions: community trust, community satisfaction, community attachment, and urban attachment (Wu *et al.* 2019). Lin *et al.* also measured the emotional connection of rural residents with their living place based on the dimensions of attachment to a place and place identity, and examined the importance of cultural space in the formation of a sense of place (Lin *et al.* 2020). Sarmast and Metousli analyzed the role of place scale in the sense of belonging to a place in Tehran, Iran. The result of their study indicated a relationship between the sense of belonging to a place and the reputation of localities (Sarmest & Metousli 2009). Roshni *et al.* using the fuzzy hierarchy technique, measured the sense of spatial belonging of the localities of Gorgan's historical context. They found that the measures of vitality, attachment to place,

satisfaction with place and collective memories are effective in the sense of belonging to a place, respectively (Roshni *et al.* 2017). Sejasi Keidari *et al.* related to the relationship between vandalism and the decrease in the sense of belonging to a place in the rural areas of Pirasher Birjand and concluded that law evasion along with factors such as breaking cultural norms, destruction and theft causes a decrease in the sense of place belonging to the villagers (Sejasi Keidari *et al.* 2019). Motlaq and Farhadipour 2019, to determine the relationship between sustainable social development and the sense of place belonging, reported that there is a positive and significant relationship between all three components of sustainable social development and citizens' sense of place belonging (Motlaq & Farhadipour 2019).

MATERIALS AND METHODS

The present research method is descriptive-analytical. The collection of data and information was performed in two forms, documents and surveys. First, the conceptual and theoretical dimensions of the subject were examined using the documentary method, and then field surveys were conducted in the study area to collect ground data and interviews with the residents of the local community. To collect the information required for statistical analysis, 374 questionnaires were distributed in the study area and after collection and screening, the obtained data were processed. Also, in order to know the amount of land use changes during the studied period, using remote sensing techniques and satellite image processing, land use maps of the studied area in 2000 and 2022 from the images ETM+ and OLI meters were extracted in 5 classes using support vector machine (SVM) algorithm. Next, the area of each class and the amount of change occurred were determined. The studied area included the villages of Alborz Mountains in the south and east part of Guilan Province, Northwest Iran. Spatial distribution in the 11 studied Rural district, which have 276 rural points and 14,725 households, located among the Rudbar, Siahkal and Amlesh cities. The area of the region is equal to 2428 km^2 and is spread at an altitude between 0 and 3000 m (Fig. 2).

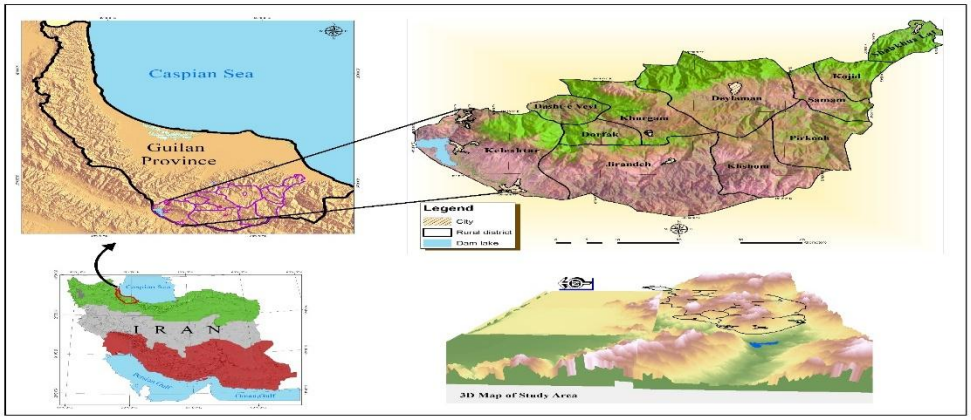


Fig. 2. Study area.

RESULTS AND DISCUSSION

The sense of belonging to a place is one of the deepest and the most sublime feelings that exists among the inhabitants of any land. This concept appears in various forms. It ranges from pride in the physical characteristics of a place, to insisting on keeping alive the native culture that is the product of that particular place, to its highest form, which is sacrifice. This feeling goes so far that throughout history, countless people have given up their lives to protect the land they felt they belonged to. What considered in this study is to investigate the quality of the sense of place belonging in the rural settlements in the southern Guilan Province, which are located in the heights of the Alborz Mountain range. Also, based on the results, this research seeks to find out why this quality of the sense of place belongs in the present time. In order to achieve this goal, it was determined that there have been significant changes in the architecture of the buildings and as a result, the nature and view of the settlements has changed through the field survey in the studied area. In other words, this event, which is combined with the confusion caused by the plurality of architecture and the way of building in this area, has made the traditional function of rural settlements undergo an unsustainable transformation. Variation in physical appearance in the geographical space of the studied area is increasing in the ever-increasing disconnection with climate and nature. This trend has occurred in Deylaman and Espili with a more noticeable intensity. The many social and economic problems of agriculture-based production have caused some villagers to seek changes in their production methods to provide economic and social security. Because they believe that agriculture no longer has economic justification

(Rey & Gunnerud Berg 2011). The process of changing the agricultural to a non-agricultural economy has a certain result, i.e., the change of land use, which will cause a change in the type of land use and management in the village (Bewket & Stroosnijder 2003). The purchase of high-quality land in the rural areas of the north of the country and the construction of luxurious villas by non-native residents have grown significantly in recent years. These constructions, along with the presence of strangers as new residents in the villages and their life with the natives, have led to significant changes in the lifestyle of the village. These changes have had various consequences and effects on the lives of the villagers. So that they experience different or conflicting feelings and perceptions of the continued presence of strangers in their villages (Tavakoli Rad 2022). Unstable livelihood of the local community, along with the growing desire of urban residents to own second homes in areas with good weather, is one of the most important reasons that have overcome attachment to the place and encouraged residents to sell land to others. As a result, at the same time as the population ratio and structure changes, we see land use changes and as a result, the original identity of rural settlements changes (Figs. 3 and 4). Also, in Tables 1 and 2, depict the area of each land use class.

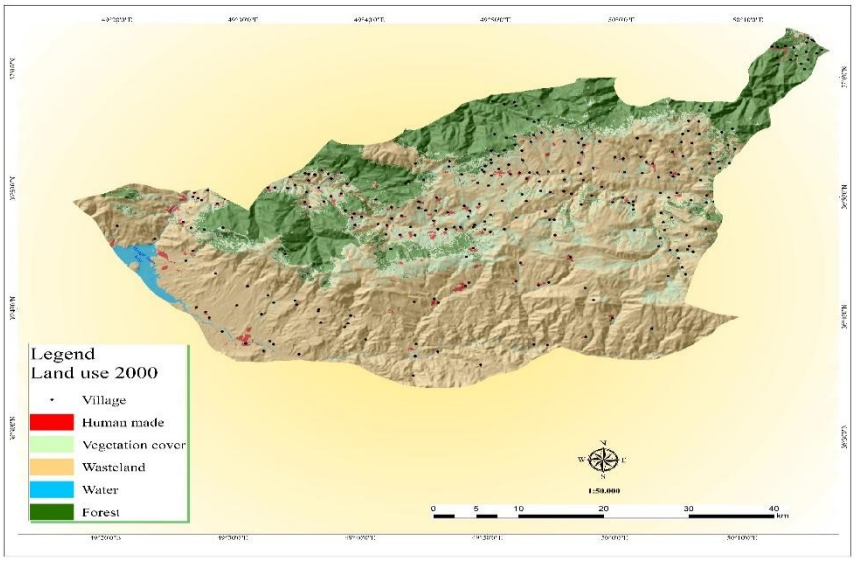


Fig. 3. Land use map of the studied area in 2000.

Table 1. Area of use in 2000.

Classes	Human made	Vegetation cover	Wasteland	Water	Forest
Area	2875.19	36669.06	151762.23	2920.23	55148.82

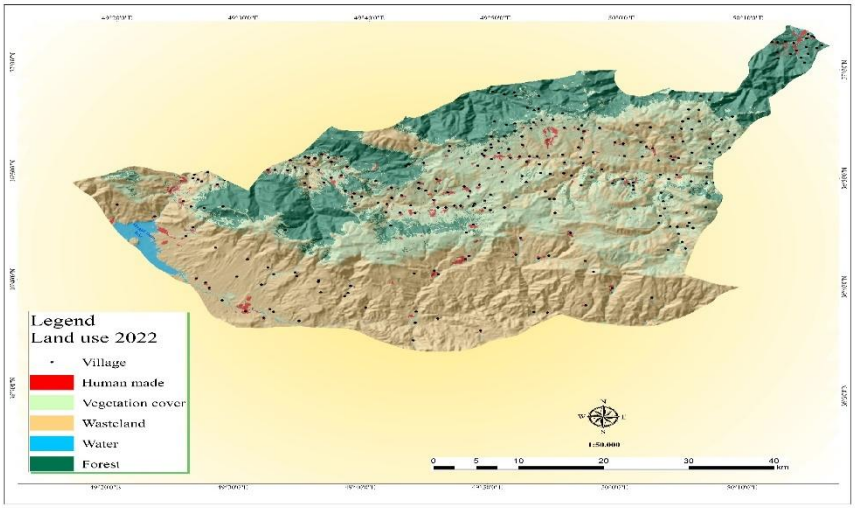


Fig. 4. Land use map of the studied area in 2022.

Table 1. Area of use in 2022.

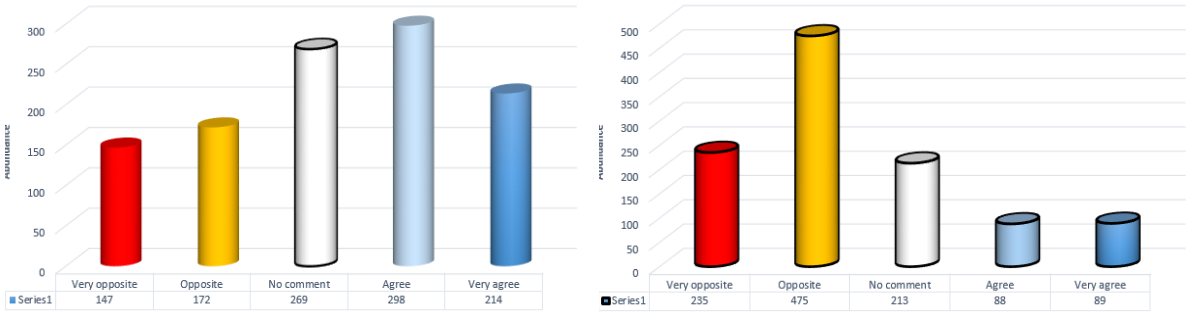
Classes	Human made	Vegetation cover	Wasteland	Water	Forest
Area	3215.56	71035.3	119562.88	2738.64	52826.17

Table 3 presents the amount of land use changes in the studied period between 2000 and 2022. It can be clearly seen that natural elements and resources have faced a decrease in the area. In the meantime, barren land is facing a decreasing trend due to construction.

Table 3. Change of land use area between 2000-2022.

Classes	Human made	Vegetation cover	Wasteland	Water	Forest
Area in 2000	2875.19	36669.06	151762.23	2920.23	55148.82
Area in 2022	3215.56	71035.3	119562.88	2738.64	52826.17
Area difference	340.37	34366.24	-32199.35	-189.59	-232.265

Based on the land use maps extracted from satellite images, it was found that man-made areas increased by 340.37 ha during the studied period from 2000 to 2022. For instance, the Deylaman region can be mentioned as one of the parts that has been severely affected by anthropogenic alterations. The maps produced by processing satellite images with SVM algorithm have estimated the area of man-made class of Deylaman City in 2000 as 41.24 ha. This is despite the fact that after less than a quarter of a century, the area of these man-made areas has increased to 195.9 ha, equivalent to 154.66 ha. Gustafson believes empirical findings converge with theoretical conceptualizations of place in social sciences. Therefore, he argues that the results of empirical studies need not be limited to "particular places", but may contribute to more general empirical and theoretical discussions about the roles and meanings of place in contemporary society using the proposed analytical framework (Gustafson 2001). The results of the field interviews show that the sense of belonging to the place has diminished among the residents of the target villages in the present study. Although the residents participating in the survey consider their place of residence as a good place, but the idea of continuing to live for a long time is unpleasant in the minds of the residents (Fig. 5A-B).



A

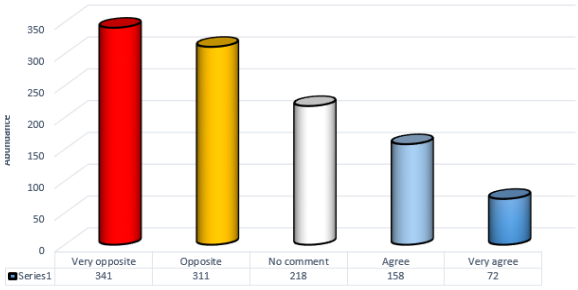
Question 1. In my opinion, this village is a good place to live

B

Question 2. I expect to live in this village for a longer time

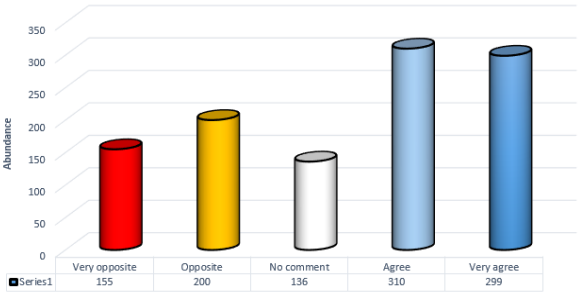
Fig. 5A-B. The quality of the place of life and the prospect of continuing to live in the village.

It also seems that due to livelihood reasons and the lack of necessary infrastructure development in these areas, the native residents of the studied settlements have no desire to settle in their places of residence for a long time and they believe that in order to improve the quality of life, they should leave their homeland and move to the cities bring shelter (Fig. 6A-D). The sense of belonging to the place among the natives has changed to the point where they sometimes feel like they are strangers in the place of their birth and life. The most important cause of this feeling is the change in the population ratio and the arrival of second home owners, which usually include non-native and urban people (Fig. 7).



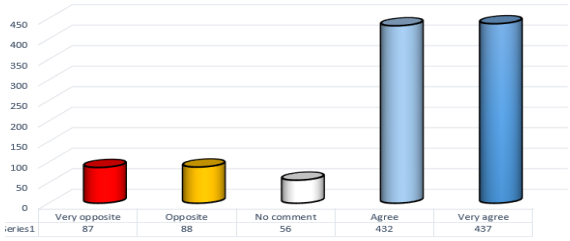
A

Question 1. It is possible for me to progress in the affairs of life and work in the village



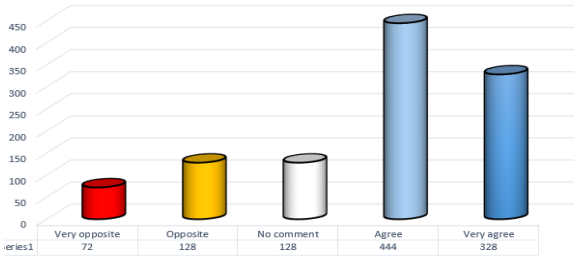
B

Question 2. I believe that in order to have a better job, I should go from the village to the city



Question 3. I prefer my children to finish their education in the city

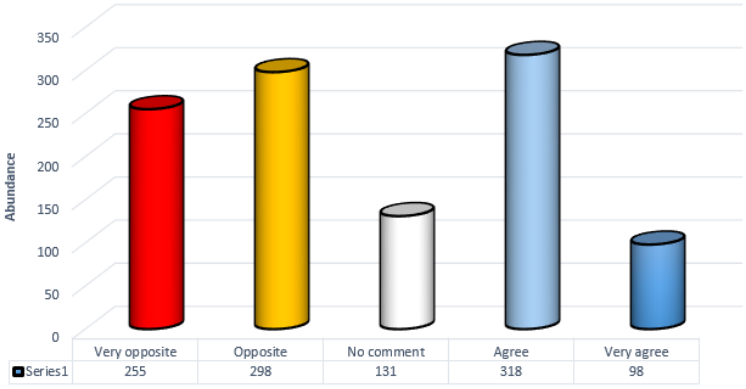
C



Question 4. If I earn better, I will leave the village

D

Fig. 6A-D. Sustainable livelihood and quality of children's education.



Question 1. I sometimes feel like an outsider

Fig. 7. Feeling of homelessness in native residents of the village.

CONCLUSION

One often most important collective feeling among human societies has long the sense of belonging to a place. By meeting the needs in the upper levels of Maslow's pyramid, the meaning of the environment becomes deeper, to the extent that at higher levels, the feeling of belonging to a place is manifested in a more emotional way, which shows the depth of this feeling. The results of the study by Eren (2013) showed that attachment to a place brings environmental awareness. As it was mentioned and it was evident that responses of the residents of the local community to the questionnaires, the problems in providing a sustainable livelihood are most important concerns and it has caused them to ignore the sense of place belonging to their living environment. According to the findings of Lv & Chen, attachment to place in residents has a significant positive effect on their willingness to protect the heritage of their ancestors (Lv & Chen 2021). The increase in the price of land in the studied areas has led to the classical activities of these rural areas, which were mostly based on food production through agriculture, horticulture and animal husbandry, to perform false activities in big cities. With the sale of land, the structure and population ratio of these communities have undergone various changes, and we continue to see changes in the functional structure of rural settlements in the mountainous areas of Southern Guilan Province. The results of the study by Karimi *et al.* also show the lack of success in implementing the policy of transforming the village into a city and the regional development of Deylaman City, Guilan Province (Kirimi *et al.* 2015). Among the

components of the quality of life, economic indicators and the duration of residence in the village have the greatest effect on the sense of place belonging (Ahmadi & Mahdavi 2015). The results of the research of Belanche *et al.* based on the data of 1153 residents of rural and urban settlements in Spain, showed that there is difference between both residential environments in geographical identity. Meanwhile, the residents of urban communities had a weaker place identity than the villagers. In addition, the emotional and value dimensions of place identity change in opposition to the age factor and explain how place identity develops differently in rural and urban settlements. They conclude that these differences are not due to the size of the community, but to the type of community and its personal connection (Belanche *et al.* 2021). Tavakli Rad in 2022 reported that the presence of strangers in the village has caused unpleasant feelings among the villagers. In such a way that their presence in the village has caused unpleasant feelings such as conflict, discrimination, anger, humiliation, regret and dissatisfaction to be perceived among the rural residents. Also, the result of these unpleasant feelings has resulted in consequences such as the dualization of the rural life pattern, the shows of ownership by strangers, the intensification of social inequalities, the collapse of the common rural economy, and the increase in the desire to migrate among young people (Tavakoli Rad 2022). The noteworthy point in comparison with the present study is that the sense of belonging to the place in the residents of the studied villages is gradually decreasing. This is the extent that based on the answers received, residents believe that a better future and higher quality education depends on migrating to the cities. Although this analysis from the villagers is not far from the mind due to the lack of necessary infrastructure and support for the people living in the mountain villages. But the current process will have unfortunate consequences for the continued survival of rural settlements. As Anabastani & Faal Jalali stated, the type of rural housing architecture and their style, with their specific socio-economic structures, are distinguished from cities and can create a sense of belonging to a place for their residents and an independent identity (Anabastani & Faal Jalali 2021). Meanwhile, the information extracted from land use maps during 2 decades shows a significant increase in man-made areas in the studied area, which can be mentioned as the most significant part of Espili- Deylaman. The dramatic and disorderly increase of second houses with heterogeneous architecture with the climate and nature of the region, which was observed in the field survey, has left only a memory of the green area of Espili and shows the loss of sense of belonging to the local residents and the change in the population ratio of these areas. Amar, 2013 also in a study conducted based on a field survey in the villages of Siahkal, Guilan, the decrease in the population of villagers and the inefficiency of agricultural activities were listed as the most important reasons for the growth of villa construction in these areas (Amar, 2013).

Also, quality of life, the dependence on place and place identity can be effective in the longevity of rural youth (Alizadeh & Ghasemi 2016).

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